

PROJECT TITLE : NITRATE-REDUCTION BY CONTROLLED FERMENTATION

PERIOD COVERED : MAY 21 - JUNE 20 1981

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## 1. TRIALS

### 1.1. NINO Trial 67

Denitrated RL-sheet was produced in the pilot-plant in Richmond with the material treated in Neuchâtel during NINO trial 67 (1). We received 220 kg of denitrated RL-sheet and 113 kg of base-web. They will be stored in Onnens and in the pilot-plant until they are used in test cigarettes. TLA are in progress, but first analyses show a  $\text{NO}_3\text{-N}$  content of 0.04% DWB in the final sheet.

### 1.2. LEAR Trial 6

For this trial, which was run from May 18 to 22, the usual Marlboro Burley blend was replaced by selected top-leaves (tips) as feedstock.

Extract generated at  $80^\circ\text{C}$  in the Rotocell contained a nitrate and ammonia-nitrogen content of 2.1 g/l split into the unfavourable ratio of  $3/4 \text{ NH}_3\text{-N}$  and  $1/4 \text{ NO}_3\text{-N}$ .

After 24 hours at a dilution rate  $D$  of  $0.1 \text{ h}^{-1}$ , the fermentation was run at  $D = 0.2 \text{ h}^{-1}$ . Almost instantly, residual nitrate appeared in the fermented extract. The denitration remained insufficient until the end of the trial, in spite of the fact that the dilution rate was lowered again to  $0.1 \text{ h}^{-1}$ . An infection was already detected in the fermenter a few hours after the end of the batch.

### 1.3. LEAR Trial 7

LEAR trial 7 has been running since June 15. Its objective is to repeat the successful denitration of LEAR trial 5 (2), but in the 750-l fermenter. Therefore, the extraction was carried out at low temperature ( $20^\circ\text{C}$ ) and the extract was fermented first at a dilution rate of 0.1, then 0.15 and finally at  $0.2 \text{ h}^{-1}$ . Despite a small infection detected by microscopic examination, total denitration of the extract was achieved for 3 days. However the pH was lowered to 4.5 in order to avoid the growth of the infection. Since the morning of June 18, the acid consumption dropped very quickly and no more acid was used for the last 34 hours of this trial's first week. Up till now, no suitable explanation for this has been found. After 20 hours of continuous running without addition of acid, nitrates appeared in the fermented extract.

This might be due to the lack of phosphates which are usually added by means of a mixture of acids. When the fermenter was cooled down for the week-end, about 250 ppm of  $\text{NO}_3\text{-N}$  remained in the extract. The trial will be extended until June 26.

## 2. CIGARETTES

Three new cigarettes were produced during the period covered (3).

## 3. PILOT-PLANT

See monthly report : "Pilot-Plant Operations" June 1981 by N. Lüthi.

## 4. REFERENCES

1. Ruf-C Monthly Report (March 1981)
2. Ruf-C Monthly Report (May 1981)
3. Borgognon-D Monthly Report (June 1981)

*Ruf*

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